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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/739,753	12/20/2000	Hee Bok Kang	HME/K-10Q	4978

34610 7590 09/11/2003

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EXAMINER

LUHRS, MICHAEL K

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Am

Office Action Summary	Application No. 09/739,753	Applicant(s) KANG ET AL.	
	Examiner Michael K. Luhrs	Art Unit 2824	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-41 is/are pending in the application.
- 4a) Of the above claim(s) 22,23,25,32,33 and 40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-21,24,26-31,34-39 and 41 is/are rejected.
- 7) ☒ Claim(s) 18-20,31,35 and 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> . | 6) <input checked="" type="checkbox"/> Other: <u>updated search history</u> . |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I in Paper No. is acknowledged. The traversal is on the grounds that there is not a burdensome search. This is not found persuasive because definitive searching is necessary for methods that form the different configurations, symmetric, asymmetric, and island region. The requirement is still deemed proper and is therefore made FINAL.

2. The applicant's selection of the claims drawn on Group I includes claims 25 and 40 that are readable on Group II since they include 'island shape', rather than Group I, and are therefore considered non-elected claims.

Drawings

3. The approval of the drawings is withdrawn because error has been found. All plan views, i.e. top views that show 111 and 111a are not accurate. For example: in Fig. 10g (top view of Fig. 11g), 111 and 111a do not match 111 and 111a in Fig. 11g's depiction of these structures-- an example correction is attached for applicant's review.

Claim Objections

4. Claims 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (see **35 USC § 112** first and second paragraphs)

5. Claims 31, 35 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 27, 39 and 41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

If new matter is added to the claims, the examiner should reject the claims under **35 U.S.C. 112**, first paragraph - written description requirement. *In re Rasmussen*, 650 F.2d 1212, 211 USPQ 323 (CCPA 1981). MPEP 2163.06

Claims 27, 39 and 41 add new matter of “wordline driver”, “decoder” and “output unit” to method claims. Claim 41 is included for its dependency on claim 39 having the new matter. Applicant requested to cancel these claims.

8. Claims 15-21, 24, 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The issue is the sufficiency of the disclosure in making/forming structure 111:

Claim 15 identifies the ‘111 connection’, using structural language, whereas the actual formation steps to achieve the structure is absent. In re Wands: the 111 structure is three dimensional and specifically in three planes. Selectivity is based on one layer with another. The selective removal will involve etching onto the layer itself in the vertical direction. There is no instruction for stopping the selective removal vertically.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 15, 16, 21, 26, 31, and 34-36 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 15 recites the limitation "first and second" in line 18. There is insufficient antecedent basis for this limitation in the claim. It is recommended that "first and second" be inserted in line 16 and then "said" be inserted prior to "first and second" in line 18, since there are dependent claims which refer to "first and second" ferroelectric layers, albeit "first and second" as identifiers to the ferroelectric layers is not critical to identifying the ferroelectric layers since they are located as being formed on all/the first electrodes.

b. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: steps are unknown... "folded shape" in line 3 is insufficient as method step instruction.

c. Claims 21 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: Mentioning only the 'electrical coupling' is an insufficient method step instruction. It is necessary to include a method instruction in order to achieve such electrical coupling.

d. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: The claim identifies a connection but is absent of method steps to achieve such a connection.

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e. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: forming the "field regions" Claim 31 recites the limitation "field regions..." in line 7. There is insufficient antecedent basis for this limitation in the claim.

i. In Claim 31 please add --said-- prior to "forming" in line 1.

f. Claim 34 recites the limitation "second contact holes" in line 4. There is insufficient antecedent basis for this limitation in the claim. Claims 35-36 are dependent thereon.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 28, 29, 30, 37 are rejected under 35 U.S.C. 102(e) as being anticipated by White, Jr. et. al. USPN 6,130,102.

Regarding Claim 28: first and second wordlines, as 108 in Fig. 7 line 60 column 6;

first and second impurity regions, as 113 in Fig.7 line 21 column 7;

first and second capacitors, as 36c, lower electrode, lines 10-11 column 5, 38, ferroelectric layer, line 31, column 5, 40, upper electrode, line 57, column 5, all in line 53, column 5;

first and second conductive layers, as 36 a/b Fig. 6, lines 9-12, column 5; and

first and second bitlines, lines 5-10, column 7.

Regarding Claim 29: Ferroelectric capacitors as mentioned above, again see line 53 column 5.

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Regarding Claim 30: first electrode, ferroelectric layer, and second electrode as mentioned above, again, as 36c, lower electrode, lines 10-11 column 5, 38, ferroelectric layer, line 31, column 5, 40, upper electrode, line 57, column 5, all in line 53, column 5.

Regarding Claim 37: insulating layer, as 110, line 57-58, column 6.

Allowable Subject Matter

13. Claim 15 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, first and second paragraph, set forth in this Office action. (see also item 6, in Paper No. 6 for previous allowance statement).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Closest art is the following:

Forbes et. al. USPN 6,141,238 teaches conventional DRAM processing in column 14-15 and a selective etch is noted 628 Fig. 8B.

Bohm et. al. USPN 6,258,658 teaches Pt over large area ferroelectric, column 4.

Nakabayashi USPN 6,337,238 teaches ion milling in column 11.

White, Jr. et. al. USPN 6,130,102 shows contact holes 34 a/b, Fig. 4, lines 37+, column 4, and 36c, Fig. 5, but for lower electrode.

Pertinent art: Onishi et. al. USPN 5,854,104; Kang et. al. USPN 6,306,704 ; Kang et. al. USPN 6,319,731 ; Choi et. al. USPN 6,524,868 ; Sugawara et. al. USPN 6,544,834 ; Kim US PGPub 2001/0003662; Lee USPGPub 2003/0077844.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael K. Luhrs whose telephone number is 703-305-2864. The examiner can normally be reached on M-F; 8:00 a.m. - 5:00 p.m. .

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 703-308-2816. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

MKL

Michael K. Luhrs
August 28, 2003


MICHAEL S. LEBENTRITT
PRIMARY EXAMINER